voltage generating the electrical field E1 and the vector representing the second electrical field (E2) being located on an axis not parallel to the axis on which the vector of the first electrical field (E1) is located,

(e) the application of electrical signals for controlling the value of the standing magnetic field (B), the frequency and the amplitude of the alternating voltages generating the electrical fields E1, E2 and the electromagnetic fields EM1, EM2, the application of these electrical signals being used to create (i) an electron cyclotron resonance (ECR) wherein the axis of the centripetal acceleration orbit of the electrons and of the other charged particles is parallel to the longitudinal axis X-X' (ii) of the electron cyclotron resonances (ECR) wherein the axes of the centripetal acceleration orbits of the electrons and of the other charged particles oscillate gyromagnetically.

2. The method as claimed in claim 1, wherein the plasma generated is a cold plasma.

3. The method as claimed in claim 1 or 2, wherein the standing magnetic field (B) with a high degree of uniformity comprises:

(a) a first uniform magnetic field (B1), the field lines of which pass through a first closed curve located in a plane perpendicular to the longitudinal axis X-X' and centered on this axis,

(b) a second uniform magnetic field (B2), the field lines of which pass through a second

closed curve located in the same plane as the plane containing the first closed curve, the second closed curve being located inside the first closed curve.

4. The method as claimed in one of the preceding claims, wherein the arc of the angle formed by the vector representing the first electrical field (E1) created by the application of the alternating voltage and by each vector representing the or each second electrical field (E2) created by the application of the alternating voltage is between 60 and 120°.

5. The method as claimed in one of the preceding claims, wherein the amplitudes and the frequencies of the alternating voltages generating the electrical fields E1, E2 and the electromagnetic signals EM1, EM2 are approximately equal.

6. The method as claimed in one of the preceding claims, which is applied to the decontamination of the ambient air and of any other gaseous medium, by destroying and/or transforming the atoms and molecules that make up the contaminants present in the ambient air or in the gaseous medium, by the electromagnetic and electromechanical energy of the plasma.

7. The method as claimed in claim 6, wherein the contaminants are made up of one of the following types or a combination of the latter: microbic aerosols comprising pathogenic micro-organisms such as bacteria, spores, viral and retroviral particles, pathogenic proteinic agents such as

prions; volatile and aromatic organic compounds, chlorofluorocarbons, various oxidizable and oxidizing elements such as oxygen, nitrogen and sulfur; ozone; and fibers and particles originating from dust and smoke.

8. The method as claimed in claim 6 or 7, wherein the air or any other contaminated gaseous medium is probed manually or automatically to determine the presence and the quantity per unit of volume of the various contaminants, before introducing the gas stream into the abovementioned confinement chamber.

9. The method as claimed in claim 8, wherein the information or data concerning the presence or the quantity per unit of volume of contaminants in the ambient air or in the gaseous medium is used to control the electrical signals.

10. A plasma-generator-forming device, wherein the plasma is of multipolar gyromagnetic electron cyclotron resonance (ECR) type, and which comprises:
(a) a gaseous medium confinement chamber (1) comprising at least one treatment chamber (40) which comprises at its upstream end a first perforated transverse plate (2a) made of an electrically conductive material, a first perforated wall (3a) made of an electrically insulating material and opaque to the electromagnetic signals, fixed to the upstream side of the first perforated plate (2a), a second perforated transverse plate (2b) made of an electrically conductive material fixed to the upstream side of the first perforated wall

(3), a second perforated transverse wall (3b) made of an electrically insulating material and opaque to the electromagnetic signals fixed to the upstream side of the second perforated plate (2b) and a third perforated transverse wall (32) parallel to the first perforated plate (2a) and axially spaced from the latter to delimit the confinement chamber, the third perforated wall made of an electrically insulating material and opaque to the electromagnetic signals, and situated at the downstream end of the treatment chamber (40) to allow the gas stream to leave through the third perforated wall,

(b) a means (4) for generating a first uniform magnetic field (B1), the vector representing this first magnetic field (B1) being parallel to the longitudinal axis X-X' of the treatment chamber (40), this longitudinal axis X-X' passing through the center of the first perforated plate (2) and the third perforated wall (32),

(c) a means (5) for generating, in the treatment chamber (40), a second uniform magnetic field (B2) in the first uniform magnetic field (B1), the vector representing the second magnetic field (B2) being parallel to and having the same direction as the vector representing the first uniform magnetic field (B1),

(d) a means (6, 7) for emitting an electromagnetic signal (EM1) in the gaseous medium of the treatment chamber (40) to produce free electrons in this gaseous medium, by the application to this means (6, 7) of at least one alternating voltage (V6; V7),

(e) a means (9, 10) for generating a first uniform electrical field (E1) in the plasma, by the application to this means (9, 10) of at least one alternating voltage (V6; V7), the amplitude and the frequency of which can be variable and the axis on which is located the vector representing the first uniform electrical field (E1) being perpendicular to the longitudinal axis X-X' of the treatment chamber (40),

(f) a means (12, 13) for generating one or more second electrical fields (E2) in the plasma, by the application to this means (12, 13) of a first alternating voltage (V6) and the axis on which is located the vector representing each second electrical field (E2) not being parallel to the axis on which is located the vector representing the first uniform electrical field (E1),

(g) a powering system (14) controlling the value of the first and second uniform magnetic fields (B1, B2), the frequency and the amplitude of the alternating voltages (V6; V7) and of the first alternating voltage (V6), this powering system (14) being used to generate (i) an electron cyclotron resonance (ECR) wherein the axis of the centripetal acceleration orbit of the electrons and of the charged particles is parallel to the axis X-X' of the treatment chamber (40) (ii) of the electron cyclotron resonances (ECR), wherein the axes of the centripetal acceleration orbits of the electrons and of the charged particles oscillate gyromagnetically.

11. The device as claimed in claim 10, wherein the plasma is a cold plasma.

12. The device as claimed in claim 10 or 11, wherein the means (9, 10) for generating the first uniform electrical field (E1) comprises:

(a) a first cylinder (9) coaxial to the longitudinal axis X-X', made of an electrically conductive material, delimiting the volume of the treatment chamber (40), the upstream end of this first cylinder (9) is fixed to the first perforated plate (2a) and the downstream end of the first cylinder (9) is fixed to the third perforated wall (32), this first cylinder (9) being powered by the first alternating voltage (V6),

(b) a second cylinder (10) made of an electrically conductive material, the longitudinal axis of which is colinear to the longitudinal axis X-X', disposed concentrically inside the first cylinder (9), the upstream end of the second cylinder (10) is fixed to the second perforated plate (2b), its downstream end is a free end with teeth (33) and the second cylinder (10) has a plurality of circumferential drilled holes (17; 18a; 18b) through which the gas ionized by the plasma circulates, this second cylinder (10) being powered by the second alternating voltage (V7), the first alternating voltage (V6) and the second alternating voltage (V7) having the same amplitude and the same frequency but being in phase opposition, the powering system of the first and second cylinders (9; 10) inducing a capacitive coupling.

13. The device as claimed in one of claims 10 to 12, wherein the circumferential drilled holes (17; 18a; 18b) of the second cylinder (10) comprise at least three circumferential series of circular perforations (18a; 18b) from the downstream free end of this second cylinder (10), and a circumferential series of rectangular perforations (17) extending longitudinally along the axis X-X' and disposed approximately toward the upstream end of the second cylinder (10).

14. The device as claimed in one of claims 10 to 13, wherein the means (4) for generating the first uniform magnetic field (B1) comprises a solenoid-forming assembly (4) surrounding the first cylinder (9) and wherein the means (5) for generating the second uniform magnetic field (B2) comprises a second solenoid (5) disposed inside the second cylinder (10), the first and second solenoids (4; 5) being powered by a current I1 and these first and second magnetic fields (B1, B2) inducing an inductive coupling in the treatment chamber (40).

15. The device as claimed in one of claims 10 to 14, wherein the means (6, 7) for emitting electromagnetic signals in the treatment chamber (40) comprises:

   (a) a central rod (6) made of an electrically conductive material extending longitudinally inside the treatment chamber (40) and presenting a tapered end, this central rod (6) is fixed to the first plate (2a), perpendicularly and approximately in its center, and it is surrounded by the second solenoid (5) over at

least a part of its length, this central rod (6) being powered by the first alternating voltage (V6);

(b) a plurality of peripheral rods (7), made of an electrically conductive material, extending longitudinally in the treatment chamber (40), presenting a tapered end, these peripheral rods (7) are fixed to the second perforated plate (2b) perpendicularly to the latter, and are disposed concentrically on a circle of radius between the radius of the first cylinder (9) and the radius of the second cylinder (10), these peripheral rods (7) being powered by the second alternating voltage (V7).

16. The device as claimed in one of claims 10 to 15, wherein the means (12, 13) for generating the second electrical field (E2) by the application of a third alternating voltage (V3) comprises:

(a) a plurality of large radial partitions (12) made of an electrically conductive material, extending longitudinally in the treatment chamber (40) such that their longitudinal free edges are parallel to the axis X-X', these large radial partitions (12) are fixed, on their longitudinal part, to the internal surface of the first cylinder (9) and they are fixed on their upstream transverse part to the first perforated plate (2a), the transverse width of these large partitions (12) is less than the distance between the first cylinder (9) and the second cylinder (10), the first alternating voltage (V6) being applied to the diametrically opposite large partitions (12);

(b) a plurality of small radial partitions (13) made of an electrically conductive material, extending longitudinally in the treatment chamber (40) such that their longitudinal free edges are parallel to the axis X-X', these small radial partitions (13) are fixed, on their longitudinal part, to the internal surface of the first cylinder (9) and they are fixed on their upstream transverse part to the first perforated plate (2a), the width of these small partitions (13) is less than the width of the large partitions (12), the small partitions are diametrically opposite and they include at least three series of circular perforations (132) from their downstream transverse free edge, and the first alternating voltage (V6) is applied to the small partitions (13).

17. The device as claimed in one of claims 10 to 16, wherein the powering system (14) comprises:
    (a) an electrical power supply means (23) for this powering system (14) delivering an alternating voltage (V4),
    (b) a means (35) for transforming the alternating voltage (V4) from the input source (23) into an intermediate alternating voltage (V5),
    (c) a means (36) for varying the frequency of the intermediate alternating voltage (V5), and
    (d) a means (28) for transforming this intermediate alternating voltage (V5) into the first and second output alternating voltages (V6; V7), and into the output current (I1).

18. The device as claimed in claim 17, wherein the electrical power supply means (23) is a mains input source which supplies a mains voltage (V4) of approximately 220 V at a frequency of approximately 50 hertz.

19. The device as claimed in claim 17 or 18, wherein the value of the intermediate alternating voltage (V5) is between approximately 10 and 50 volts.

20. The device as claimed in claim 19, wherein the value of the intermediate alternating voltage (V5) can take approximate values of 10, 24 or 50 volts.

21. The device as claimed in one of claims 17 to 20, wherein the value of the first and second alternating voltages (V6; V7) is between 1 and 30 kilovolts at a frequency of between 5 hertz and 10 kilohertz for a power of between 1 and 30 watts.

22. The device as claimed in one of claims 17 to 21, wherein the means (28) for transforming the intermediate alternating voltage (V5) into the first and second alternating voltages (V6; V7) is a transformer (28), the impedance of which is adapted automatically and with no loss of power to the varying impedance of the device.

23. The device as claimed in claim 22, wherein the core of the transformer (28) is based on ferrite and rare earth elements.

24. The device as claimed in one of claims 17 to 23, wherein the value of the current (I1) is between 1 microAmp and 0.1 Amp.

25. The device as claimed in one of claims 17 to 24, wherein the value of the first and second alternating voltages (V6; V7) is approximately 15 kilovolts for an output power of approximately 100 watts.

26. The device as claimed in one of claims 18 to 24, wherein the value of the output alternating voltage (V6; V7) is approximately 5 kilovolts for an output power of approximately 30 watts.

27. The device as claimed in one of claims 18 to 26, wherein the diameter of the first cylinder (10) is approximately 13 centimeters and wherein the device is in an operating state when the current (I1) circulating in the first and second solenoids (4, 5) is approximately 0.1 Amp and this value of the current (I1) is combined with the following pairings of alternating voltage (V6; V7) value and frequency value: 1 kilovolt; 350 hertz or 1.5 kilovolts; 500 hertz or 2 kilovolts; 650 hertz.

28. The device as claimed in claim 14, wherein the solenoid-forming assembly (4) comprises three separate and axially attached solenoids (4a, 4b, 4c), mounted on the first cylinder 9, the first and third solenoids (4a, 4c) having a number of windings per unit of length greater than the number of windings of the second solenoid (4b), the value of the magnetic fields (B1a, B1c) resulting from the

first and third solenoids (4a, 4c) is greater than the value of the magnetic field (B1b) resulting from the second solenoid (4b).

29. The device as claimed in one of claims 10 to 27, wherein the confinement chamber (1) comprises a second treatment chamber (41) in the extension of the first treatment chamber (40), in which the first cylinder (9) is prolonged by a first truncated conical nacelle (42) made of an electrically conductive material, converging toward the third perforated wall (32) which separates the two treatment chambers (40, 41); the perforated wall (32) is sandwiched between a third perforated transverse plate (43) made of an electrically conductive material integral to the first nacelle (42) and a fourth perforated transverse plate (44) made of an electrically conductive material; the second treatment chamber (41) is formed by a second truncated conical nacelle (47) integral to the fourth plate (44), converging toward the upstream chamber and integral at its downstream end to a third cylinder (48) made of an electrically conductive material, integral, via its downstream end, to a fifth perforated transverse plate (50) made of an electrically conductive material; a fourth perforated wall (51) made of an electrically insulating material is fixed to the downstream side of the fifth plate (50); a sixth perforated transverse plate (59) made of an electrically conductive material is fixed to the downstream side of the fourth wall (51); and a fifth perforated transverse wall (60) made of an electrically insulating material is fixed to the downstream side of the sixth plate (59); wherein the

second treatment chamber (41) also comprises a fourth cylinder (52) made of an electrically conductive material fixed to the sixth perforated plate (59) and including a series of at least three transverse rows of circumferential drilled holes (53) at its upstream free end and teeth (54) extending axially from its free end; and a fifth cylinder (55) of diameter less than that of the cylinder (52) and longer than the length of the cylinder (52), the fifth cylinder (55) being fixed to the fifth plate (50) and including a series of at least three transverse rows of circumferential drilled holes (56) at its upstream free end and teeth (57) extending axially from its free end, and wherein the device also comprises a rod (45) with tapered free end made of an electrically conductive material fixed to the plate (44) and projecting into the upstream chamber (40) by passing through the wall (32) and the plate (43) in an electrically insulated manner; spikes (49) made of an electrically conductive material disposed concentrically on the fourth plate (44) and projecting into the downstream chamber (41); and the solenoid-forming assembly (4) comprising three solenoids (4a, 4b, 4c) attached and disposed coaxially around the upstream and downstream chambers (40, 41), the number of windings of the second solenoid (4b) being greater than the number of windings of the first and third solenoids (4a, 4c).

30. The device as claimed in claim 29, wherein the first alternating voltage (V6) is applied to the plate (2a) and to the plate (59), and wherein the second alternating voltage (V7) is applied to the plate (2b) and to the plate (50).

31. The device as claimed in any one of claims 10 to 30, wherein the gaseous medium comprises a stream of ambient air or of any other gaseous medium at ambient temperature and atmospheric pressure, and wherein this gaseous medium is charged with any combination of inert particles, nonbiological organic particles, contaminant inorganic particles, biological particles such as bacteria, bacterial spores, fungi, fungal spores and/or viruses, and wherein these particles are destroyed or transformed during their passage through the treatment chamber (40) before leaving the treatment chamber (40) through the third perforated wall (32).

32. The device as claimed in claim 31, which comprises at least one manual or automatic probing device, this probing device being used to provide information concerning the presence of the various types of contaminants, this information being transmitted manually or automatically to a control device coupled to the power supply (14), this control device being used to modulate the alternating voltage (V6; V7) and the current (I1) according to the level of contamination at the device inlet.